APPENDIX III. RABIES EXPOSURE

WASHINGTON RABIES PROPHYLAXIS DECISION-MAKING

Although human rabies is rare in the US (2-6 cases per year), animal bites are common, and result in rabies post-exposure prophylaxis (PEP) given to thousands of people each year. Rabies is almost universally fatal without appropriate PEP (human diploid cell rabies vaccine and rabies immune globulin) is a safe and effective means of prevention. However, PEP is expensive (over $1000 to treat an adult) and rare adverse reactions can occur. Therefore, potential rabies exposures and the need for PEP should be carefully evaluated.

CDC recommendations for rabies PEP are available on the CDC website at www.cdc.gov/ncidod/dvrd/rabies/prevention&control/preventi.htm. These reccomendations were last updated in 1999 and are still current and applicable in Washington. The decision to provide PEP following an animal bite or other high risk exposure will vary by the animal species involved, and by region of the country where exposure occurred, as the prevalence of rabies in species varies by region. A suggested algorithm for exposure in Washington is reviewed below.

1. **Was the person exposed to a bat, or bitten or licked on an open wound or mucous membrane by another possibly rabid animal?**
Determine whether the bite was provoked or unprovoked. Bites inflicted while attempting to feed or handle an apparently healthy animal should be generally regarded as provoked. If a bite was provoked, it is less likely to have been caused by a rabid animal.

   Humans have been infected with bat rabies after minimal or no documented contact with bats[4,5]. Rabies exposure should be considered to have occurred if a bat is present and the individual cannot exclude a possible bite, for example if a bat is found in a room where people were sleeping, or with children too young to provide reliable information about contact. However, casual contact with other animals (such as petting) does not constitute an exposure and is not an indication for prophylaxis even if the animals are rabid. If only casual contact occurred with an animal other than a bat, we generally do not recommend rabies testing.

2. **Have first aid and wound care been performed?**
Immediate and thorough washing of wounds and scratches is perhaps the most effective measure to prevent rabies. Tetanus prophylaxis and measures to control bacterial infection should be given as indicated.

3. **Is rabies known or suspected to be present in the species and area?**
The information presented elsewhere in this report does not unequivocally rule out rabies in a given animal, since all mammals are potentially susceptible to rabies, but is useful in assessing the risks and benefits of treatment, particularly if an animal is not available for testing or observation. Each year the DOH Public

Health Laboratories (PHL) and Public Health -Seattle& King County Laboratory perform rabies testing on hundreds of animals that have potentially exposed humans to rabies. Of 5,008 bats examined from 1970-2002, 393 or 7.8 were rabid. Rabid bats have been found in almost every Washington County. Rabies in domestic animals is extremely rare in Washington, however, in 2002, a pet cat was found to have bat-variant rabies. Although common in some parts of the USlimited surveillance for terrestrial has never identified raccoon-variant rabies in Washington (through 2002). Rodents and lagomorphs, such as beaver, guinea pigs, gopher, rats squirrels, rabbits, and hares, have never been found to have rabies in Washington and are rarely infected anywhere in the US.

4. **Was the animal captured?**
If bat exposure occurred but the bat escaped, we recommend treatment. For other animals not available for testing, an individual decision must be made, considering the risk of disease and the risks from treatment.

5. **Was the captured animal a normally behaving dog, cat or ferret?**
Quarantine and observation for 10 days can be used to rule out rabies only in normally behaving dogs, cats and ferrets. Other animals must be tested to rule out rabies definitively. This includes dog-wolf and cat-bobcat hybrids, and other wild or exotic animals.

6. **Does the dog, cat or ferret become ill under observation during the next 10 days?**
A dog, cat or ferret remaining well for at least 10 days was not infectious for rabies at the time of the bite. Ill animals should be humanely killed without injuring the brain and tested for rabies. Call the Communicable Disease Epidemiology Section at 206-361-2914 (24 hour number) before shipping any specimens for rabies testing. In Seattle/King County, call 206-296-4632 (after hours 206-296-4774).

7. **Does laboratory examination confirm rabies?**
The fluorescent antibody and mouse inoculation tests for rabies are extremely reliable in diagnosing or ruling out rabies when performed properly in a qualified laboratory. Rabies testing of animals following human exposure is available without charge at the PHL after consultation with an epidemiologist. If the animal is a healthy-appearing dog, cat, or ferret, 10 days of observation is preferred to euthanization, especially in circumstances where an attack was provoked.

8. Treat with serum and vaccine.

See treatment regimens (below) with human diploid cell rabies vaccine (HDCV) and human rabies immune globulin (RIG). HDCV and RIG are available in a limited number of facilities in Washington (see 2003 Emergency Biologics Listing from DOH) or contact pharmaceutical companies directly.

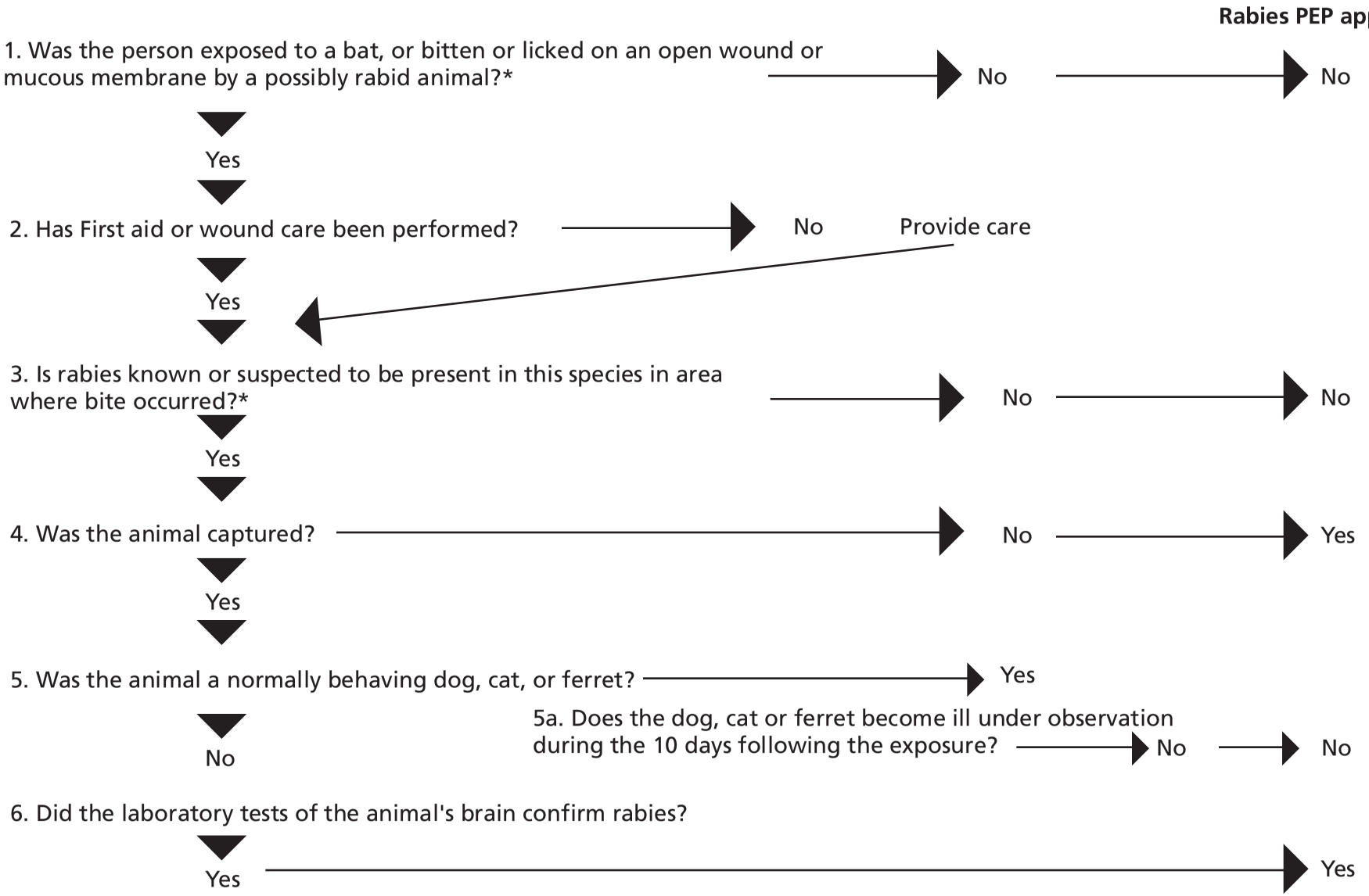
References:

1. Human Rabies Prevention, United States, 1999 – Recommendations of the . Advisory Committee on Immunization Practices (ACIP). *MMWR* **1999**; 8 (RR07):1-21.
2. Compendium of Animal Rabies Prevention and Control, National Association of State Public Health Veterinarians, Inc., 2000. *MMWR* **2000** 49;(RR08):19-30.
3. Fishbein, D. "Rabies Virus." in Mandell G.L. ed. Principles and Practice of Infectious Disease. 2000. Churchill Livingstone, Inc.

4 Human Rabies - Washington, 1995. *MMWR* **1995**;44:625-627.

5. Human Rabies - Montana and Washington 1996. *MMWR* **1997;** 46:770-774.

ALGORITHM FOR RABIES POST-EXPOSURE PROPHYLAXIS (PEP) IN WASHINGTON STATE



*** Bats are the only significant rabies reservoir in the Pacific Northwest. Although raccoon rabies is common in other parts of the US, especially the Mid-Atlantic states, no rabid raccoons have ever been identified in Washington, the surrounding states or provinces. Since 1970, among more than 8,000 animals tested at the State Public Health Laboratory, the only animals (other than bats) identified as having rabies were a dog, two cats, a llama, a horse, and two skunks. Rabies is extremely rare in rodents.**

RABIES PROPHYLAXIS REGIMENS

Pre-exposure prophylaxis (immunization prior to a bite)
Pre-exposure prophylaxis may be considered for certain high-risk groups. This includes veterinarians, animal handlers, persons – especially children – living in or visiting countries where rabies is a constant treat, and persons whose vocational or avocational pursuit brings them into contact with potentially rabid animals.

Medication	Dose	Route of administration	Vaccination schedule
Human diploid cell rabies vaccine (HDCV) Primary series	1 ml	Intramuscular (IM) – deltoid	One dose given on days 0, 7, and 21 or 28 days[1,2]

Post-exposure prophylaxis (immunization after a bite, not previously vaccinated)[3]

Medication	Dose	Route of administration	Vaccination schedule
Human diploid cell rabies vaccine (HDCV)	1 ml	IM – deltoid	One dose given on days 0, 3, 7, 14, and 28,
Rabies immune globulin (RIG)	20 IU per kg. body weight	If feasible – full dose should be infiltrated around wound(s), and any remaining given Im at site distant from vaccine administration	One dose only when treatment is begun

Notes:
1. Booster doses are not recommended per MMWR 48:RR1 (1/8/99)
2. Routine serologic testing for rabies antibody after vaccination is no longer recommended. In a study in the US over 1,000 persons received HDCV according to this regimen and developed serum antibody.
3. If previously immunized, give HDCV 1.0ml, IM in the deltoid area on days 0 and 3

ANIMAL RABIES

Rabies was endemic among in dogs in King County between 1937 and 1940. During the 1950s and 60s, major efforts at pet vaccination and animal control eradicated the canine variant of rabies in the United States, however the disease in US wildlife has been documented at record levels nationwide during the last two decades.

Between 1970 and 2002, 14,142 animals were tested for rabies in Washington and 400 (2.8%) were found to have rabies. This does not represent the actual number of case of rabiesthat occur, since no routine surveillance in animals is conducted and most animals are submitted for diagnostic testing only after human exposure has occurred.

The primary reservoir of rabies in the northwest has been bats. Of the 6,410 bats examined for rabies between1960 and 2002, 526 (8.2%) were rabid. Rabid bats have been found in almost every county in Washington State. More recently, between 1990-2002, 222 of the 225 rabid animals in Washington were bats. While terrestrial animal variants of rabies have not been identified in Washington, rabies is occasionally transmitted from bats to other mammals including humans. During 2002, testing identified a domestic cat and 12 bats infected with rabies virus.

Domestic Animals

A cat from Walla Walla county was found to have rabies during 2002. The cat was infected with a bat-variant of the rabies virus, however how the exposure occurred was unknown, although the cat was unvaccinated and allowed to roam outdoors. Ten people received rabies PEP due to exposure to the cat before it died. This was the first rabid cat in Washington State since 1976. Annually in the US, twice as many cats as dogs are reported to have rabies.

In 1987 a dog suspected to have rabies in Pierce County, became ill six months after exposure to a rabid bat. The dog was tested at the PHL and rabies was identified in brain tissues, however, the infection was not confirmed at CDC. In 1992, a horse from Benton County died of rabies. In 1994, a llama from King County died after becoming infected with a bat-variant of rabies virus.

Wild Animals, Rodents and Lagomorphs

Although common in some parts of the US, raccoon, skunk and fox variants of rabies virus have not been documented in Washington. Four rabid skunks identified in the 1960s and 1970s were either imported from outside the state or inappropriately given live virus rabies vaccine. Rodents and lagomorphs, such as mice, guinea pigs, gophers, rats, squirrels, and rabbits, pose a very low risk of rabies, and rabid lagomorphs have never been found in Washington. Bites from other wild animals should be evaluated on a case-by-case basis, as surveillance for terrestrial rabies is limited in this state and lack of data does not definitely rule out its presence.

Species	1930-1949	1950-1969	1970-1989	1990-1999	2000-2002	TOTAL
Bat	0	75	171	165	57	468
Cat	19	2	1	0	1	23
Cattle	37	0	0	0	0	37
Coyote	1	0	0	0	0	1
Dog	1,415	24[1]	1	0	0	1,440
Goat	2	0	0	0	0	2
Horse	0	0	0	1	0	1
Llama	0	0	0	1	0	1
Sheep	1	0	0	0	0	1
Skunk	0	2[2]	2[2]	0	0	4
TOTAL	1,475	103	175	167	58	1,978

[1]Dog from California
[2]Skunk imported ill or improperly vaccinated

APPENDIX IV SPECIAL TOPICS

ANTIMICROBIAL RESISTANCE – Washington State Department of Health

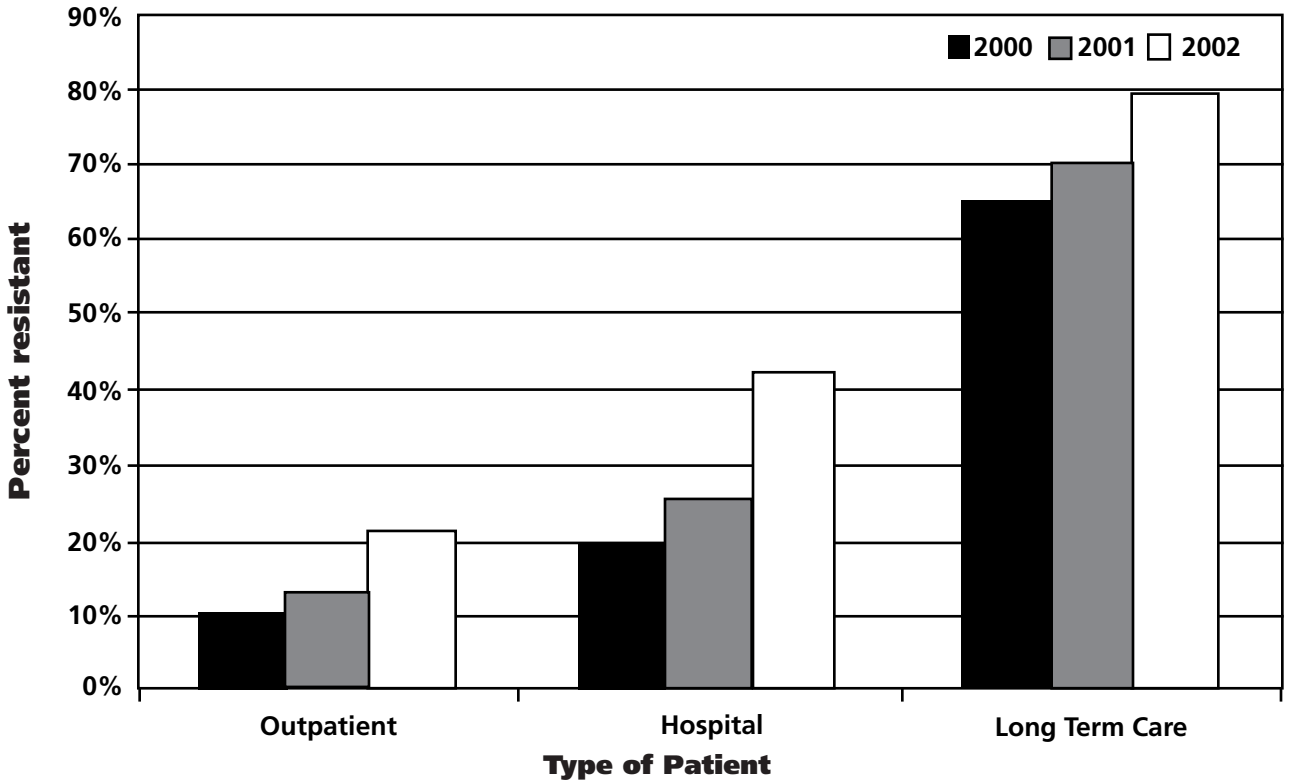
Bacteria that acquire resistance to previously effective antimicrobial drugs cause prolongation of illness, increase health care costs, and raise the specter of a future with fewer choices for the treatment of infectious diseases. There are several risk factors common to infections caused by various resistant bacteria. These include previous or current antibiotic therapy, hospitalization or residence in a long-term care facility, underlying illness, invasive medical procedures or devices, and very young or old age.

Although infections caused by antibiotic resistant bacteria are not routinely notifiable in Washington State, hospitals and laboratories are asked to participate in a network of sentinel reporters to provide information on trends of resistance. In 2002, thirty facilities providing laboratory services to inpatient and/or outpatient populations provided information to DOH, including Cumulative Antimicrobial Susceptibility Test Data (antibiograms) and reports of invasive pneumococcal infection. This type of information does not provide incidence rates for disease, but does give estimates of the prevalence (percent) of resistance among organisms that have been identified by laboratory diagnosis.

Methicillin Resistant *Staphylococcus aureus* (MRSA): *S. aureus*, often simply called "staph" is frequently found on the skin or in the nose of healthy people without causing illness. However, it can cause minor and major illnesses; including pustules, boils, abscesses, wound infections, pneumonia or life threatening bacteriemia. MRSA are staph that have developed resistance to all penicillins as well as to the cephalosporins (e.g. Keflex®) commonly used empirically to treat skin infections. MRSA is a serious problem in health care institutions and is now also appearing in the community in persons without the common risk factors for MRSA infection. The infection is spread by direct contact with persons who are infected or are carriers of the organism. Good hand hygiene and infection control precautions by health care workers decrease transmission.

The prevalence of MRSA is increasing in Washington State, as it is in other parts of the country. In 2002, thirty-one percent of all reported *S. aureus* isolates causing invasive and non-invasive disease were methicillin resistant. The average yearly increase in MRSA prevalence has been 6.5% over the three years that data from across the state have been aggregated. The prevalence of MRSA for cultures taken from only hospitalized patients was 42%, with methicillin resistance among hospital isolates varying among regions of the state from 34% to 52%. Prevalence of MRSA was highest among cultures taken from resident of long term care facilities (79%).

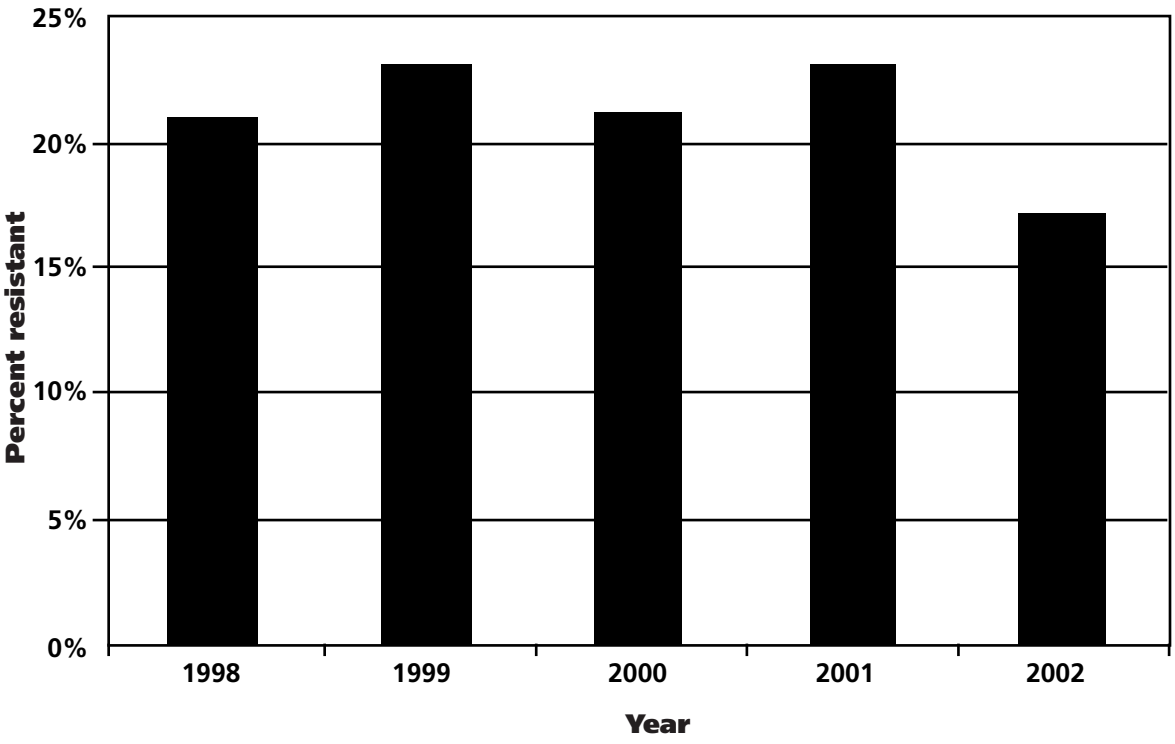
Increase in MRSA over Three Years



***Streptococcus pneumoniae* Invasive Disease:** *S. pneumoniae* (pneumococcus) is an important cause of otitis and sinusitis, pneumonia, meningitis and bactermia, and is a leading cause worldwide of illness and death in young children, debilitated persons and the elderly. Pneumococci are commonly found in the upper respiratory tract and are transmitted by person-to-person and respiratory droplet spread. Since the introduction of the pneumococcal conjugate vaccine for children in 2000, the incidence of invasive disease in the United States has begun to decline in the age groups affected by the vaccine.

Two hundred and thirty-one cases of invasive pneumococcal infection (with *S. pneumoniae* isolated from blood or spinal fluid) were reported to DOH in 2002. As many as 40% of pneumococcal infections in some parts of the US are resistant to penicillin. In Washington, intermediate or complete resistance to penicillin, (usually the antibiotic of choice) rose to 21% by 1998. After remaining somewhat stable for the intervening years, non-susceptibility decreased in 2002 to 17%. This corresponds to a small but declining trend in resistance seen in some, but not all, parts of the country. The rate of non-susceptibility to penicillin was significantly greater for children less than twelve years old (37%) than for adults (13%).

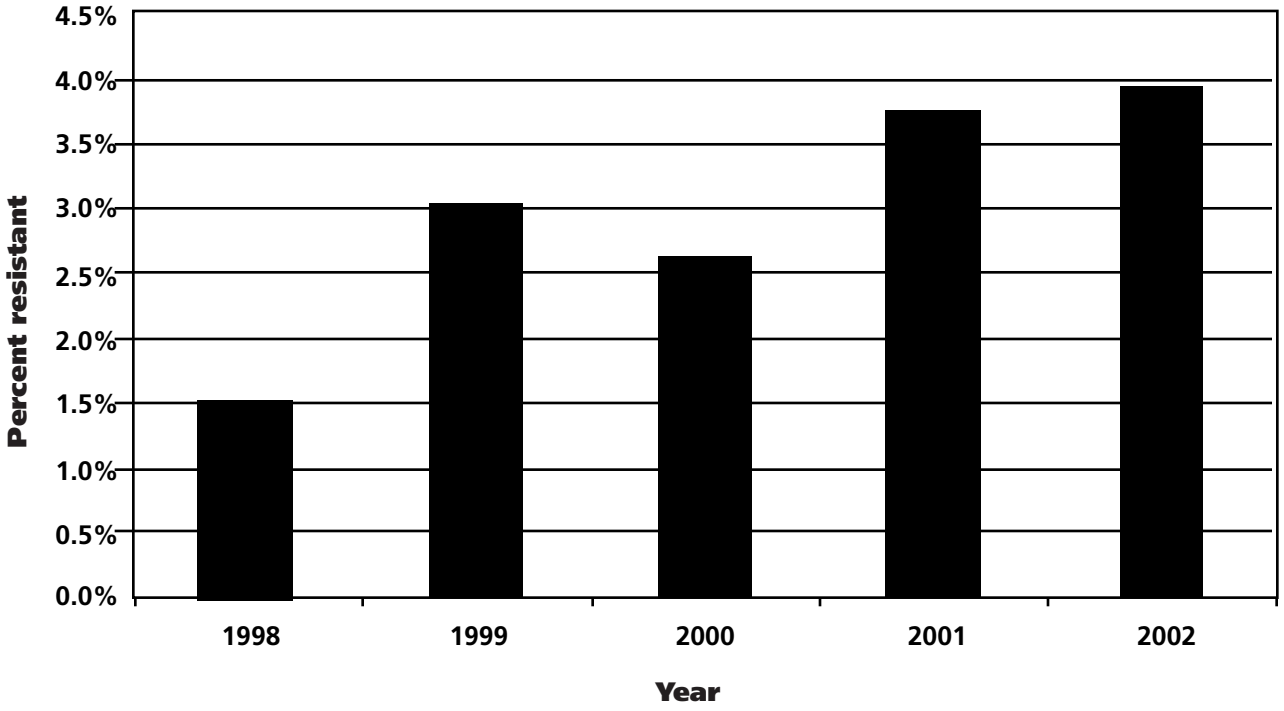
Invasive Streptococcus Pneumoniae
Percent Non-susceptible to penicillin



Vancomycin Resistant Enterococcus (VRE): Enterococci are bacteria that normally inhabit the bowels of humans and other warm-blooded animals. These bacteria have the ability to cause a variety of serious conditions in hospital patients, including urinary tract and wound infections, endocarditis, and bactermia. These organisms are inherently resistant to some antibiotics, and can acquire resistance to most others in an environment of exposure to multiple antibiotics. Vancomycin is the only drug that remains effective in many cases of enterococcal infection. Vancomycin resistance is also monitored closely because enterococci have the ability to readily exchange resistance genes with a number of other organisms for which vancomycin is an important treatment option.

VRE isolates come mainly from hospitalized patients who are colonized or infected (with either invasive or noninvasive disease) with Enterococcus. The prevalence of VRE, while at low levels, has increased over the past five years from 1.5% to almost 4 % in 2002. This is lower than the national reported average of 12%VRE isolated from hospitalized patients.

Vancomycin Resistant Enterococci (VRE)



Prevention: Prevention and control efforts consist of programs to prevent the spread of resistant organisms in health care settings, and to promote the judicious use of antibiotics. Strategies include surveillance and culturing to identify resistant organisms, the use of contact precautions by health care workers, medical practice guidelines for appropriate anti-infective therapies, public and health care provider education on antibiotic use and misuse, auditing of antimicrobial use patterns in health care organizations, and restrictions on the use of certain key drugs.

BABESIOSIS CAUSED BY A NEWLY DESCRIBED BABESIA ORGANISM –
Washington State Department of Health

Babesiosis is a potentially fatal zoonosis, caused by several species of intraerythrocytic parasites. The infection is transmitted most commonly by an infected tick, but may also be transmitted by blood transfusion from an infected donor. In the US, most cases of babesiosis are caused by *Babesia microti* and are acquired in the northeastern states where the tick Ixodes scapularis is the vector and *Peromyscus leucopus* (white-footed mouse) is the reservoir. Babesiosis is rare in Washington, but infections caused by a Babesia species, designated WA1, were reported in 1991 and 1994 in a resident of rural eastern Washington (1991) and a donor and recipient of a blood transfusion (1994).

In 2002, an infection caused by another newly identified *Babesia* organism was reported in a western Washington resident. The patient was an 82-year-old asplenic man who lived in a rural area and was exposed to tick habitats daily while he jogged or walked his dog. He was hospitalized in July 2002 with fever, hematuria, anemia, and acute renal failure. A blood smear showed the presence of intraerythrocytic organisms suspicious for *Babesia*. The initial level of parasitemia on admission to the hospital was 35%. He recovered after 26 days of treatment with clindamycin and quinine.

Specimens of his blood were forwarded to the CDC where testing was performed by indirect fluorescent antibody assay for antibodies to *B. microti, B. divergens,* and WA1 antigens. In addition, the 18S ribosomal RNA gene of the organism was amplified by polymerase chain reaction (PCR) and sequenced.

The patient's antibody titer to B. divergens rose from 1:64 at diagnosis to ≥1:4096 6 weeks later. Phylogenetic analysis showed that the organism was closely related to the bovine parasite, *B. divergens*, and secondarily to the deer parasite, B. odocoilei. Babesia DNA was detected by PCR in the patient's blood 8 weeks following the discontinuation of therapy, and he has remained well. Efforts to capture and identify possible tick vectors in areas where the patient may have been exposed were unsuccessful.

We concluded from the laboratory evidence that the patient was infected by a previously undescribed *Babesia,* closely related to *B. divergens*. The presence of the organism in the pateint's blood (documented by PCR) months after therapy suggests he had a persistent, low-grade infection, a phenomenon described with other *Babesia* species. The importance of the organism, and description of the vector, reservoir, and risk factors for infection, are not yet known, however, health-care providers and public health investigators should be vigilant for zoonotic infections caused by novel vector-borne pathogens.

CAMPYLOBACTER JEJUNI *OUTBREAK IN A CORRECTIONAL FACILITY - Washington State Department of Health*

DOH was notified by the Walla Walla County-City Health Department and Washington State Penitentiary (WSP) of four distinct outbreaks of diarrheal illness occurring among staff and inmates at WSP in March, July, October and December of 2002. *Campylobacter jejuni* was confirmed as the causative agent in each outbreak.

Epidemiological and environmental investigations were initiated in March, July and December by local, state and federal public health investigators. Case-control studies, environmental inspections, staff interviews and laboratory analysis were used to identify cases of illness, foods and other common exposures associated with illness and environmental factors responsible for, or contributing to, each outbreak.

Sixty-four suspected, probable, or confirmed cases were identified in March; 34 in July; 13 in October, 1 in November and 45 in December. Isolates of *Campylobacter* obtained from cases in each of the four outbreaks shared a pattern that was indistinguishable by pulsed field gel electrophoresis (PFGE) analysis. CDC verified that *C. jejuni* isolates with this PFGE pattern had not identified in the US during the six months preceding the outbreaks. Analysis of data from case-control studies implicated food items served by the institution kitchen, particularly those prepared in an area of the kitchen used for salad preparation, however *C. jejuni* was never isolated from any food, water or environmental samples tested. Further, no food items or food ingredients were common to all the outbreaks.

Food items significantly associated with illness for three outbreaks

Outbreak	Food item	OR (p value)
March	Tuna salad	4.8 (.002)
July	Dinner salad	6.1 (.006)
December	Pasta salad	4.5 (.04)
December	Tuna salad	6.4 (.02)

Three extensive investigations identified potential sources of contamination and led to recommendations to prevent future outbreaks at the facility. Despite changes implemented by the facility, and extensive environmental sampling to detect the source of *Campylobacter,* outbreaks continued to recur. The most remarkable feature of theseoutbreaks is the indistinguishable PFGE pattern shared by *C. jejuni* isolates obtained from cases in March, July, October and December. Had the organism persisted in a living host or an environment that allowed replication, it is unlikely that the pattern would remain unchanged. Further, *Campylobacter* is fragile and does not persist well in the environment. Laboratory evidence supports the hypothesis that each outbreak was caused by contamination from a source common to all of the outbreaks, however no such source of *Campylobacter* has been identified despite multiple epidemiological and environmental investigations.

INFLUENZA 2002 – Washington State Department of Health

Influenza is a highly contagious respiratory infection caused by influenza virus, which is transmitted by respiratory droplets or contact with respiratory secretions. Three types of influenza viruses cause illness in humans: type A, associated with epidemics and pandemics; type B, usually associated with regional epidemics; and type C, which occurs sporadically and in minor localized outbreaks. Approximately 20,000 deaths are caused in the US each year by complications of influenza, and influenza vaccine is the most effective means to prevent or ameliorate disease caused by types A and B. Current recommendations of the CDC's Advisory Committee on Immunization Practices (ACIP) for the use of influenza vaccine are available on www.cdc.gov/ncidod/diseases/flu/hc_providers.htm.

Symptoms of influenza include fever, headache, pharyngitis, nasal congestion, nonproductive cough, malaise, and myalgias. Gastrointestinal symptoms rarely occur except in small children. The incubation period of influenza is usually1-4 days, and the virus can be transmitted from one day before the onset of symptoms until 5 days after onset, sometimes longer in children. Washington State influenza surveillance is conducted in conjunction with the CDC from October through May of the following year. nfluenza activity was mild locally and nationally during the 2002-2003 season. State activity peaked about 3 weeks later than the average peak, from the last week of February through the end of March.

Sentinel surveillance laboratories reported 220 influenza isolates, with identification of at least one influenza isolate in 18 counties; 64% of influenza was isolated from King County residents, and16% from Spokane County residents. The number of influenza isolates is reflective of population size and possibly, greater sentinel laboratory participation in these counties. Eighty-three percent of the influenza isolates were type A, and 17% type B. Of the 94 influenza A isolates subtyped, 56 (60%) were A, H1N1, (39%) were A, H3N2, one (1%) was A, H1N2. Twenty-six percent of surveillance isolates were obtained from patients four years of age or younger, 33% 5-19 years of age, 28% 20-59 years of age, and 5% were 60 years of age or older. Age for 7% of the patients was not reported. The influenza strains circulating in Washington State and the US in 2002-2003 were antigenically similar to those contained in the 2002-2003 vaccine (A/New Caledonia/20/99-H1N1, A/Moscow/10/99-H3N2, and B/Hong Kong/330/01). Trivalent influenza vaccine for 2003-2004 will contain antigens of the same strains.

Influenza Outbreaks: Thirty-two long-term care facilities (LTCF) participated in sentinel LTCF surveillance; several outbreaks of respiratory illness were investigated in LTCFs, however, none had influenza confirmed as the etiology. Two outbreaks of respiratory illness in large institutions other than nursing homes were confirmed as influenza A.

Influenza Immunization rates: a survey of 44 LTCFs in 22 counties reported an average influenza vaccination rate among their residents of 85% and among staff of49%*.

*Rates of staff vaccination may be under-reported as vaccination provided by private health care providers may not be reported to their employers.

PERTUSSIS OUTBREAK - Skagit County Health Department

Outbreak notification: On May15, 2002, Skagit County Health Department (SCHD) was notified of a + DFA and culture for pertussis by the Washington State Department of Health Public Laboratories (PHL) on a 9 monthold female, who was up to date in DTaP immunization. We were notified of a + PCR for pertussis by a commercial laboratory on May 17,2002 on a 10 year old female 4th grade student at School A. And on May 20, 2002, a classmate of the index case-patient was reported to SCHD with a clinical diagnosis (not laboratory confirmed) of pertussis by her physician.

Investigation of events: DOH was immediately notified of the possible outbreak of pertussis :3 cases identified within six days. School A was notified on May18 of the index case of pertussis. A letter was drafted by SCHD for parents of classroom contacts and distributed by School A on May20, 2002. Case finding was enhanced by requesting that the local clinical laboratory inform SCHD daily about any cultures for pertussis that were sent to the PHL. Beginning the same day, alerts on the pertussis outbreak were distributed to county health care providers, laboratories, hospitals, schools and media by SCHD's Facts by Fax. A series of six alerts updated the community about the outbreak and reminded providers to report suspected cases of pertussis. Other efforts to alert the community included a televised Board of Health presentation, articles in the local newspapers and coverage on King 5 TV. Over the next 4 weeks, more than 100 contacts were evaluated for symptoms of pertussis, referred to their health care providers for diagnostic testing and treatment or prophylaxis. During this time, more than 19 confirmed or probable epidemiologically-linked cases of pertussis were identified, followed by identification of unrelated cases in the community.

Outbreak statistics: We reported a total of 62 suspect, probable and confirmed cases of pertussis as follows:

- 87 specimens sent to PHL for DFA & culture
- 4 specimens DFA +
- 4 specimens Culture +
- 6 specimens DFA & Culture +
- 1 specimen PCR & Culture +
- 1 specimen PCR + only
- 25 diagnosed by a health care provider, not necessarily reported as case
- 26 met the case definition and epi-linked, without laboratory confirmation
- 18 met the case definition without laboratory confirmation or apparent epidemiologic link

Outbreak summary: Early in the outbreak, we recognized a constant need to communicate with providers throughout the outbreak to assure recognition, diagnosis, treatment of clients, and to encourage prophylaxis of household contacts to prevent spread of pertussis. Providers failed to recognize pertussis in their clients and household transmission may have occurred when providers failed to treat contacts or waited for DFA or culture confirmation of pertussis before beginning appropriate therapy. However, neither DFA or culture are always reliable for diagnosis, therefore we recommended that providers diagnose and treat based on symptoms that met the case definition for pertussis. Most providers treated with appropriate antibiotics when they suspected pertussis. We had good cooperation and communications with the laboratories, schools, and hospital infection control. Reporting of suspected cases by local laboratories, dissemination of health alerts via Facts by Fax and telephoning providers were our biggest asset in curtailing the outbreak. At the time of this outbreak, there was a nationwide shortage of DTaP vaccine and many children did not receive their 4th and 5th dose of vaccine. However, the DOH Immunization Program obtained enough vaccine to immunize all children in Skagit County through 6 years of age. Because resources of SCHD were limited to 2 FTE Communicable Disease nurses and 1 FTE Immunization nurse, providers were supplied with enough vaccine to immunize all clients under 7 years of age and strongly encouraged to do so. However, as effective vaccine is not available for older children and adults, they may represent a significant reservoir for pertussis, limiting the effectiveness of immunization.

Statistics for our outbreak include the following:

- Only 16 cases were laboratory confirmed
- Ages of cases ranged from 4 mo. – 73 yrs
- 5 cases identified were under 1 yr. of age
- 18 cases were 1 yr. – 5 yrs. of age
- Only 5 cases had never received any DTP immunizations
- Household members of 10 cases did not receive antibiotic preventive prophylaxis
- 8 cases were not age-appropriately immunized for pertussis
- Immunization status of 14 cases was unknown
- 7 cases were epi-linked to the School A
- 32 cases lived in Mt. Vernon, 22 cases lived in Burlington, 2 cases lived in Sedro Woolley, 4 cases lived in Anacortes, and 2 cases lived in Bow

Conclusions:

1. Diagnosis of cases increased with provider awareness, as few providers obtain cultures for pertussis on their clients with a cough illness.
2. Cases may have decreased over the summer because school was out.
3. To prevent hospitalizations or death among infants, prophylaxis of contacts in day care facilities or households with children under 1 year of age is crucial.
4. Focal outbreaks may lead to disease in the general community – as our most recent case of laboratory-confirmed pertussis occurred in a 73 year-old male with no known association with School A.

Working with commercial laboratories can be a useful means of case finding.

PUBLIC HEALTH LIAISONS - Spokane Regional Health District

Over the last 2 years, the Spokane Regional Health District (SRHD) has undertaken a new program to increase public health surveillance in our community.

Health educators called Public Health Liaisons (PHLs) visit medical practices, laboratories, nursing homes and correctional facilities two to four times yearly. The purpose of these visits is to increase reporting of communicable disease, to provide a link between SRHD and the medical community, and to promote SRHD programs. Prior to initiating the visits, the PHLs developed a comprehensive database of health care providers, including veterinarians, and a Communicable Disease Reporting and Resource Manual. The manual contains a SRHD phone list, disease reporting forms, current treatment information for STDs, algorithms for proper diagnosing and reporting of hepatitis, information on vaccine preventable diseases, and materials on antibiotic resistance among other materials. Manuals are tailored to provider needs depending on the type of practice/facility served.

SRHD has strengthened relationships with area providers as a result of the Liaison visits. Communication has been enhanced by using the database and LAN FAX to rapidly distribute urgent medical information to providers. The Epigram, a monthly newsletter sent to all providers, covers a wide range of (mostly) infectious disease topics. It also provides case numbers of some notifiable conditions reported to SRHD, closing the reporting loop. Communication with providers has increased markedly with indications of an increase in the reporting of certain communicable diseases as a result of this program.

RABID CAT INVESTIGATION - Walla Walla County Health Department

On November 4, 2002, the Walla Walla County Health Department received a phone call from a local veterinarian concerned about rabies in a cat that he had hospitalized with neurologic symptoms. The domestic cat was brought in by its owners who reported that it was behaving abnormally, including scratching its head and vocalizing. A family member that had tried to pick it up and soothe the cat had been bitten on the left forearmt. During the veterinary examination, the cat was agitated, aggressive and had a seizure. In consultation with the Walla Walla County Health Department, the animal was euthanized, brain tissue tested at the Washington State Public Health Laboratory indicated the cat had rabies. Samples were forwarded to CDC for rabies virus variant identification.

An investigation team composed of a sanitarian, public health nurse, environmental health director and nursing director interviewed the family to discuss potential exposures that the family, friends or neighbors may have had with the cat. During the interviews, the investigators discovered that the cat was unvaccinated and allowed to roam freely in the neighborhood during the day.

Ten potential human exposures to the rabid cat were identified including eight family members and two neighbors. Three weeks was used as a conservative timeframe for determining who may have been exposed to the cat during the time it could have been shedding rabies virus from saliva. The investigators discussed the rabies virus, its transmission, incubation and exposure protocols and provided information about rabies post-exposure prophylaxis (PEP) and its side effects. All ten people who had potential exposure were referred to their health care providers for rabies PEP with rabies immune globulin and rabies vaccine. No major side effects were associated with the PEP

During the interviews it was found that the family also had two dogs that were not currently vaccinated against rabies. Due to the possible exposure of the dogs to the rabid cat and/or to the unknown animal that had exposed the cat, the dogs were euthanized and tested for rabies virus; both were negative.

On November 8, 2002, CDC confirmed that the cat had been infected with a bat variant of rabies virus. Bats are the only known reservoir of rabies in Washington State. Identifying the virus variant ruled out the possibility that this cat could have been infected by another terrestrial rabies reservoir, such as a raccoon or skunk. This is the first case of feline rabies recognized in Washington in approximately 26 years.

TUBERCULOSIS OUTBREAK IN HOMELESS PERSONS - Washington State Department of Health

In 2002, the Tuberculosis Control Program of Public Health – Seattle & King County (PHSKC) reported a 30-year peak in cases of tuberculosis (TB), with a 2-fold increase among the homeless compared with the previous 3 years. PHSKC, DOH and CDC collaborated in an investigation of a recent outbreak of Mycobacterium tuberculosis (MTB) among the homeless in Seattle to: 1) identify high-risk contacts, 2) evaluate those contacts for tuberculosis (TB) infection, and 3) initiate additional control measures.

We reviewed patients' medical records and estimated the duration of their infectiousness, based on clinical and microbiological findings. To identify sites where TB transmission was most likely to occur, and which contacts were most likely to be exposed at those sites, data from facilities frequented by the homeless were reviewed to document visits by infectious case-patients and the results of staff and client tuberculin skin testing. Contacts were identified through patient interviews and review of homeless facility logbooks. M. tuberculosis isolates from county TB patients were analyzed using restriction fragment length polymorphism (RFLP) techniques. Outbreak-associated case-patients were defined as: having an MTB isolate that shared an indistinguishable 15-band DNAFP, or if DNAFP results were pending, had an epidemiological link to an outbreak associated case-patient.

From January 2002 through April 15, 2003, 33 of 49 homeless case-patients with TB met our case definition. Isolates from 22 outbreak-associated case-patients shared a 15-band DNAFP, and 11 had an epidemiologic link to a case and DNAFP is pending. All but one of the outbreak-associated case-patients were US-born, 26 (79%) are male, 17 (52%) are American Indian/Alaska Native (AI/AN), and 29 (88%) have pulmonary TB. Of the patients with pulmonary disease, 20 (69%) had acid-fast bacilli identified on sputum smear at diagnosis. Seven (21%) of the outbreak-associated patients are co-infected with human immunodeficiency virus (HIV), including five AI/AN. Between January 1 and April 15, 2003, intensive screening of approximately 300 high-risk contacts using chest radiograph and/or sputum examination and culture identified 8 (24%) of the outbreak-associated case-patients.

A large, ongoing TB outbreak involving a high proportion of AI/AN patients is ongoing among homeless persons in King County. Focused, intensified screening efforts for early detection and treatment of both TB disease and latent TB infection are ongoing to control transmission in the King County homeless community. TB controllers, particularly those from western states, need to consider the possibility of unrecognized outbreaks when TB occurs among homeless persons in their community.

APPENDIX V POPULATION DEMOGRAPHICS

Washington State population estimates, 1985-2002 Office of Financial Management

Year	Estimate
1985	4,384,100
1986	4,419,700
1987	4,481,100
1988	4,565,000
1989	4,660,700
1990	4,866,692
1991	5,000,400
1992	5,116,700
1993	5,240,900
1994	5,334,400
1995	5,429,900
1996	5,516,800
1997	5,606,800
1998	5,685,300
1999	5,757,400
2000	5,894,121
2001	5,974,900
2002	6,041,700

Washington State population by age and sex

Office of Financial Management April 1, 2002 Forecast

Age (years)	Male	Female	TOTAL
<1	40228	38393	78621
1	41233	39357	80590
2	40557	38462	79019
3	41251	39358	80609
4	41253	39208	80461
5	41157	39291	80448
6	41731	39639	81370
7	42235	40275	82510
8	42945	40811	83756
9	44922	42306	87228
10-14	228573	216758	445331
15-19	225024	212805	437829
20-24	214102	202630	416732
25-29	200215	190361	390576
30-34	229497	218235	447732
35-39	233871	228423	462294
40-44	249579	247735	497314
45-49	236934	239462	476396
50-54	208576	211601	420177
55-59	161523	163624	325147
60+	403364	504196	907560
TOTAL	3008770	3032930	6041700

Washington State population estimates by county

Office of Financial Management April 1, 2002 Forecast

County	Estimate
Adams	16,600
Asotin	20,700
Benton	147,600
Chelan	67,600
Clallam	64,900
Clark	363,400
Columbia	4,100
Cowlitz	94,400
Douglas	33,100
Ferry	7,300
Franklin	51,300
Garfield	2,400
Grant	76,400
Grays Harbor	68,400
Island	73,100
Jefferson	26,600
King	1,774,300
Kitsap	234,700
Kittitas	34,800
Klickitat	19,300
Lewis	70,200
Lincoln	10,200
Mason	49,800
Okanogan	39,800
Pacific	21,000
Pend Oreille	11,800
Pierce	725,000
San Juan	14,600
Skagit	105,100
Skamania	9,900
Snohomish	628,000
Spokane	425,600
Stevens	40,400
Thurston	212,300
Wahkiakum	3,800
Walla Walla	55,400
Whatcom	172,200
Whitman	40,600
Yakima	225,000
Washington State	6,041,700

Washington State County Map